SYLLABUS: IS MATTER AROUND US PURE, STRUCTURE OF ATOM, TISSUES, FORCE AND LAWS OF MOTION, GRAVITATION, WORK AND ENERGY, NATURAL RESOURCES, IMPROVEMENT IN FOOD RESOURCES.

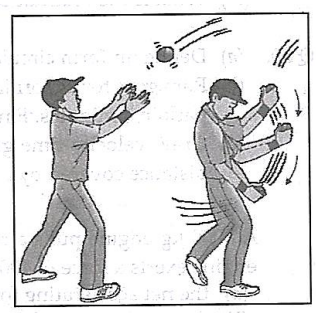
GENERAL INSTRUCTIONS: Draw Diagrams with Pencils.

- All questions arecompulsory. **Maximum Marks are 60**.
- The question paper consists of 25 Questions.
- **Section – A**: Question 1 to 10 are 1mark each.
- **Section** – B: Question 11 to 20 are 3 marks each.
- **Section** – C: Question 21 to 24 are 5 marks each.

SECTION A : (1 × 10 = 10)

Answer question numbers 1 – 4 on the basis of your understanding of the following paragraph and the related studied concepts.

The second law of motion states that the rate of change of momentum of an object is proportional to the applied unbalanced force in the direction of force. It gives the unbalanced force in the direction of force it gives the quantitative definition of force. The second law of motion is often seen in action in our everyday life. Have you noticed that while catching a fast moving cricket ball, a fielder in the ground gradually pulls his hands backwards with the moving ball? In doing so, the fielder increases the time during which the high velocity of the moving ball decreases to zero. Thus, the acceleration of the ball is decreased and therefore, the impact of catching the fast moving ball (Fig.) is also reduced. If the ball is stopped suddenly then its high velocity decreases to zero in a very short interval of time. Thus, rate of change of momentum of the ball will be large. Therefore, a large force would have to be applied for holding the catch that may hurt the palm of the fielder. In a high jump athletic event, the athletes are made to fall either on a cushioned bed or on a sand bed. This is to increase the time of the athlete's fall to stop after making the jump. This decreases the rate of change of momentum and hence the force.



1. State the second law of motion?

2. What definition of force does the second law of motion give?

3. Why does a fielder move his hands backwards while taking a catch?

4. Why in high jump athletes are made to fall on a cushioned bed?

5. $^{35}_{17}Cl$ and $^{37}_{17}Cl$ will have:
(a) Same electronic configuration
(b) Different electronic configuration
(c) Different number of protons
(d) Different number of electrons in valence shell

6. Major source of mineral in soil is the:
(a) Parent rock form which soil is formed
(b) Plants
(c) Animals
(d) Bacteria

7. Which of the following are homogenous in nature?

(i) ice (ii) wood (iii) soil (iv) Air

(a) (i) and (iii) (b) (ii) and (iv) (c) (i) and (iv) (d) (iii) and (iv)

OR

In a compound such ass water, the ratio of the mass of hydrogen to the mass of oxygen is always:

(i) 1 : 8 (b) 2 : 8 (c) 1 : 16 (d) 3 : 16

8. The work done on an object does not depend upon the:

(a) displacement (b) force applied

(c) angle between force and displacement (d) initial velocity of the object

9. Cattel husbandry is done for the following purpose:

(i) Milk production (ii) Agriculture work

(iii) Meat production (iv) Egg production

(a) (i), (ii) and (iii) (b) (ii), (iii) and (iv)

(c) (iii) and (iv) (d) (i) and (iv)

10. The girth of the stem or root increases due to:

(a) Apical meristem (b) Lateral meristem (cambium)

(c) Intercalary meristem (d) All of these

SECTION B : (3 × 10 = 30)

11. (a) What separation technique will you apply for separation for the following?

(i) Ammonium chloride from sodium chloride.

(ii) Different pigments from the extract of flower petals.

(b) Whatis crystallisation? List two ways in which crystallisation technique is better than simple evaporation technique.

12. (a) Describethe main features of Bohr's model of atom. Draw a neat and labelled diagram of energy levels.

(b) Which of the following pairs are isotopes and which are isobars?

(i) $^{58}_{26}$ A, $^{58}_{28}$ B (ii) $^{79}_{35}$ X, $^{80}_{35}$ Y

Give reasons for your choice.

(c) Elements A and B have atomic numbers 18 and 16 respectively. Which of these two would be more reactive and why?

OR

Sulphur dioxide (SO_2) is a colourless pungent smelling gas and is a major air pollutant.

(a) Write the electronic configuration of its constituent element 'sulphur and oxygen'.

(Given: $^{32}_{16}$ S, $^{16}_{8}$ O)

(b) Write valency of sulphur and oxygen.

(c) Are sulphur and oxygen isotopes of same element? Explain your answer.

13. Diffwerence between Parenchyma, Collenchyma and Sclerenchyma.

14. (a) why objects float or sink in a liquid

(b) When a ball is thrown vertically upwards, it goes through a distance of 19.6 m. Find the initial velocity of the ball and the time taken by it to rise to the highest point. (Acceleration due to the gravity, g = 9.8 m/s^2)

15. Explain the following:

(a) Why it is difficult to washy on marshy land?

(b) Why does an air filled balloon rise up slightly when punctured from below?

(c) Why does a swimmer push water backward with his hands in order to swim inforward direction?

16. (a) What is mechanical energy. Give Example.
(b) Two bodies of equal masses move with uniform velocities V and 3V respectively. Find the ratio of their kinetic energy.

17. (a) What are the different ways in which water gets polluted? How does it affect the life forms?
(b) Name two biologically improvement compounds that contain both oxygen and nitrogen.
(c) What is the role of nitrogen fixing 'bacteria'?

18. (a) Use of fertilizers for a long period causes soil pollution. Explain it?
(b) Water pollution leads to soil pollution. Justify this statement.

19. Difference between Acceleration due to gravity(g) and Universal gravitational constant (G).

20. (a) Helium atom has 2 electrons in its valence shell but its valency is not 2. Explain.
(b) Enlist the conclusion drawn by Rutherford from his α - ray scattering experiment.

SECTION C : (5 × 4 = 20)

21. A boy drops a ball from a cliff 122.5 m high. Find:
(i) How long does it take the ball to fall to the ground?
(ii) How far does it fall in the first three second?
(iii) How fast is it going at the end of three seconds?

OR

(a) You are provided with a fine white coloured powder which is either sugar or salt. How would you identify it without testing?
(b) Calculate the mass of sodium sulphate required to prepare its 20% (mass percent) solution in 100 g of water.
(c) Does the solubility of a substance change with temperature? Explain with the help of an example.

22. (a) Show the differences between the three types of muscle fibres.
(b) Give reasons for the following:
(i) Multicellular organisms are considered more efficient.
(ii) Sclerenchyma cells have a narrow lumen.
(iii) Epidermis is thicker in desert plants through it is usually single layered.

23. (a) Draw nitrogen cycle. What are the various steps included in it.
(b) A car weighing 1000 kg and travelling at 30 m/s stops at a distance of 50 m decelerating uniformly. What is the force exerted on it by the brakes? What is the work done by the brakes?

24. (a)What is conservation of momentum? Derive an expression for it.
(b) A bullet of mass 10 g is fired from a gun of mass 6 kg with a velocity of 300 m/s. calculate the recoil velocity of the gun.